

## Banksia woodland weeds

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### Introduction

Floristic studies of *Banksia* woodlands usually mention introduced species (Milewski & Davidge 1981, Bell *et al* 1979, Foulds 1988), but no comprehensive survey has been undertaken of these taxa. This paper reports a survey of the naturalized flora of 100 sites distributed between Mandurah and Moore River.

### Results

120 species were recorded as naturalized in *Banksia* woodlands within this region (Table 1). Most are Eurasian (chiefly Mediterranean) or South African in origin (Fig. 1a); However, a small but growing group originates in Eastern Australia and the Americas. This may have considerable implications for future composition of this area's weed flora. In life form the majority of weeds are annual or bulbous (chiefly the South African species) herbs, and the trees and shrubs are Australian species (Fig. 1b).

Half of the naturalized taxa were recorded at one (41 taxa) or two sites (19 taxa). Another 37 were located at fewer than 10 sites. Only 5 species (*Ehrharta calycina*, *Ehrharta longiflora*, *Lagurus ovatus*, *Romulea rosea*, *Hypochaeris glabra* and *Ursinia anthemoides*) were recorded at more than 30 sites.

Naturalized taxa occurred in a variety of disturbed areas or micro habitats within each site. Some were restricted to natural openings (*Pelargonium capitatum*) or moss swards (mainly Caryophyllaceae), edges of the remnants, tracks (43 taxa confined to track edges) or in litter under trees. Only 7 taxa were found to be abundant throughout remnants (*Avena barbata*, *Ehrharta calycina*, *Ehrharta longiflora*, *Romulea rosea*, *Gladiolus caryophyllaceus*, *Pelargonium capitatum* and *Homeria flaccida*).

The major avenue of introduction of weeds was rubbish dumping and soil transportation. Spread within a site was primarily via too many tracks being created in each remnant. Other disturbance factors were present and past grazing, clearance, frequent fires and tree felling.

From this survey the major weeds of *Banksia* woodlands are *Ehrharta calycina*, *Avena barbata* (chiefly in *Banksia prionotes* woodlands), *Gladiolus caryophyllaceus*, *Pelargonium capitatum* and *Homeria flaccida* (the last two mainly in Spearwood dune woodlands). Two special microhabitats are under threat; moss swards (Spearwood dunes invaded by small annuals) and deep litter under trees (invaded by *Myrsiphyllum* species, *Freesia leichtlinii* and *Fumaria* species).

Management of *Banksia* woodlands should aim to lower disturbance and prevent further introductions occurring.

### References

- Bell D T, Loneragan W A and Dodd J 1979 Preliminary vegetation survey of Starr Swamp and vicinity; Western Australia. W Aust Herbarium Res Notes 2: 1-21.  
Foulds W 1988 Ecology of Pinnaroo Valley Memorial Park, Western Australia: floristics and nutrient status. Kingia 1: 27-48.  
Green J S 1985 Census of the Vascular Plants of Western Australia. Dept Agriculture, South Perth.  
Milewski A V & Davidge C 1981 The physical environment, floristics and phenology of a *Banksia* woodland near Perth, Western Australia. W Aust Herbarium Res Notes 5: 29-48.

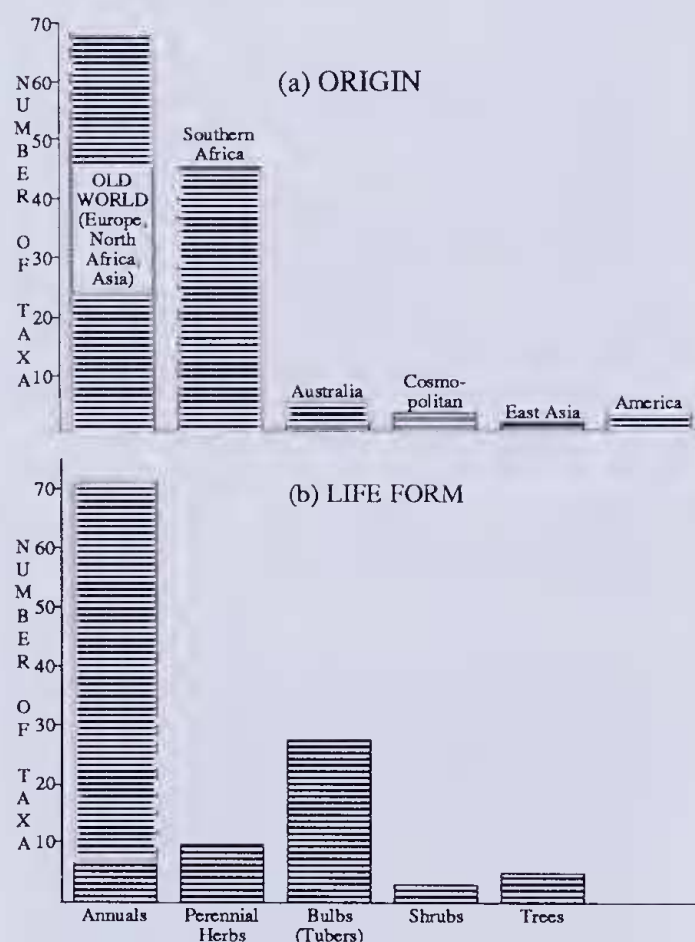


Figure 1 Area of origin and life form of *Banksia* woodland weeds.

Table 1

Species recorded as naturalized in Swan Coastal Plain *Banksia* woodlands. Figures in parentheses indicate number of times each species was recorded.

List is arranged in systematic order, after Green (1985).

Gymnosperms

Pinaceae

*Pinus pinaster* Ait. (1)

Angiosperms

Monocotyledons

Poaceae

*Aira cupiana* Guss. (22)

*Aira caryophyllea* L. (3)

*Avena barbata* Link. (21)

*Avena fatua* L. (6)

*Briza maxima* L. (11)

*Briza minor* L. (9)

*Bromus diandrus* Roth. (17)

*Bromus hordeaceus* L. (2)

*Bromus madritensis* L. (1)

*Cynodon dactylon* (L.) Pers. (2)

- Ehrharta calycina* Sm. (72)  
*Ehrharta longiflora* Sm. (74)  
*Eragrostis curvula* (Schrud.) Nees (2)  
*Hordeum leporinum* Link. (14)  
*Hyparrhenia hirta* (L.) Stapf. (1)  
*Lagurus ovatus* L. (37)  
*Lolium rigidum* Gaud. (17)  
*Pentaschistis thunbergii* Stapf. (4)  
*Stenotaphrum secundatum* (Walter) Kunze. (1)  
*Trachynia distachya* (L.) Link (1)  
*Vulpia bromoides* (L.) Gray (7)  
*Vulpia myorus* (L.) C. Gmelin. (4)
- Asparagaceae  
*Myrsiphyllum asparagoides* (L.) Willd. (2)  
*Myrsiphyllum declinatum* (L.) Oberm. (1)
- Agavaceae  
*Agave americana* L. (1)
- Asphodelaceae  
*Trachyandra divaricata* (Jacq.) Kunth. (2)
- Hyacinthaceae  
*Albuca canadensis* (L.) F.M. Leighton (1)  
*Lachenalia reflexa* Thunb. (1)  
*Lachenalia orchioides* L. (1)  
*Cyanella hyacinthoides* L. (1)
- Iridaceae  
*Babiana disticha* Ker. Gawler (1)  
*Babiana stricta* (Ait.) Ker. Gawler (1)  
*Chasmanthe floribunda* (Salisb.) N.E. Br. (2)  
*Ferraria crispa* Burman (1)  
*Freesia aff. leichtlinii* Klatt (4)  
*Gladiolus angustus* L. (4)  
*Gladiolus caryophyllaceus* (N. Burm.) Poir. (17)  
*Gladiolus undulatus* L. (1)  
*Hesperantha falcata* (L.f.) Ker. Gawler (1)  
*Homeria flaccida* Sw. (4)  
*Ixia polystachya* L. (2)  
*Romulea rosea* (L.) Ecklon (41)  
*Romulea flava* (Lam.) De Vos (7)  
*Sparaxis bulbifera* (L.) Ker. Gawler (4)  
*Watsonia aletroides* (Burm. f.) Ker. Gawler (1)
- Orchidaceae  
*Monadenia bracteata* (Sw.) T. Durand et Schinz. (2)
- Dicotyledons
- Polygonaceae  
*Rumex acetosella* L. (1)  
*Emex australis* Steinh. (4)
- Phytolaccaceae  
*Phytolacca octandra* L. (1)
- Aizoaceae  
*Carpobrotus edulis* (L.) L. Bolus (5)
- Caryophyllaceae  
*Arenaria serpyllifolia* L. (1)  
*Cerastium glomeratum* Thuill. (3)  
*Minuartia hybrida* (Vill.) Schischkin (2)  
*Petrohagia velutina* (Guss) P. Ball et Heyw. (16)  
*Polycarpon tetraphyllum* (L.) L. (1)  
*Sagina apetala* Ard. (4)  
*Silene gallica* L. var. *gallica* (9)  
*Silene gallica* var. *quinquevulnera* (L.) Koch (1)  
*Silene nocturna* L. (1)  
*Spergula arvensis* L. (1)  
*Stellaria media* (L.) Villars (2)
- Fumariaceae  
*Fumaria capreolata* L. (3)  
*Fumaria muralis* Sond. ex Koch. (2)
- Brassicaceae  
*Brassica juncea* (L.) Czernj. (1)  
*Brassica tournefortii* Gouan. (7)  
*Diplotaxis muralis* (L.) DC. (1)  
*Heliophila pusilla* L.f. (11)
- Crassulaceae  
*Crassula thunbergiana* Schultes (1)
- Resedaceae  
*Reseda alba* L. (1)
- Fabaceae  
*Lupinus angustissimus* L. (4)  
*Lupinus cosentinii* Guss. (3)  
*Medicago polymorpha* L. (17)  
*Ornithopus pinnatus* (Mill.) Druce (1)  
*Trifolium angustifolium* L. (1)  
*Trifolium arvense* L. (3)  
*Trifolium campestre* Schreber (4)  
*Trifolium dubium* Sibth. (7)  
*Trifolium glomeratum* L. (9)  
*Vicia hirsuta* (L.) Gray (1)  
*Vicia sativa* L. (7)
- Geraniaceae  
*Erodium botrys* (Cav.) Bertol (2)  
*Erodium cicutarium* (L.) L'Her. (2)  
*Erodium moschatum* (L.) L'Her. (4)  
*Geranium molle* L. (3)  
*Pelargonium capitatum* (L.) L'Her. (12)
- Oxalidaceae  
*Oxalis pres-caprae* L. (4)  
*Oxalis purpurea* L. (2)
- Zygophyllaceae  
*Tribulus terrestris* L. (1)
- Euphorbiaceae  
*Euphorbia peplus* L. (2)
- Malvaceae  
*Malva parviflora* L. (1)
- Sterculiaceae  
*Brachychiton populneus* (Schott) R.Br. (2)
- Myrtaceae  
*Agonis flexuosa* (Spreng.) Schau. (1)  
*Eucalyptus citriodora* Hook. (1)  
*Eucalyptus maculata* Hook. (1)  
*Leptospermum laevigatum* (Gaertn.) F. Muell. (1)
- Primulaceae  
*Anagallis arvensis* L. var. *caerulea* Gonan. (5)  
*Anagallis arvensis* L. var. *arvensis* (1)
- Gentianaceae  
*Centaurium erythraea* Rafn. (4)
- Lamiaceae  
*Stachys arvensis* (L.) L. (3)
- Solanaceae  
*Solanum nigrum* L. (2)
- Scrophulariaceae  
*Dischisma arenarium* E. Mey. (3)  
*Dischisma capitatum* (Thunb.) Choisy (2)  
*Parentucellia latifolia* (L.) Caruel (7)  
*Kickxia spuria* (L.) Dumort. (1)
- Orobanchaceae  
*Orobanche minor* Sm. (1)
- Rubiaceae  
*Galium murale* (L.) All. (1)
- Campanulaceae  
*Wahlenbergia capensis* (L.) A.DC. (29)
- Asteraceae  
*Arctotheca calendula* (L.) Levyns (7)  
*Conyza bonariensis* (L.) Cronq. (5)  
*Cotula bipinnata* Thunb. (1)  
*Hypochaeris glabra* L. (89)  
*Hedynopsis rhagioides* (1)  
*Lactuca serriola* L. (2)  
*Osteospermum clandestinum* (Less) Norlindh (14)  
*Pseudognaphalium luteoalbum* (L.) Burt et Hillard (16)  
*Sonchus oleraceus* L. (5)  
*Urospermum picroides* (L.) Scop. ex F.W. Schmidt (6)  
*Ursinia anthemoides* (L.) Poir (94)  
*Vellerioephyton dealbatum* (Thunb.) Hilliard et Burt (4)